File Formats 3
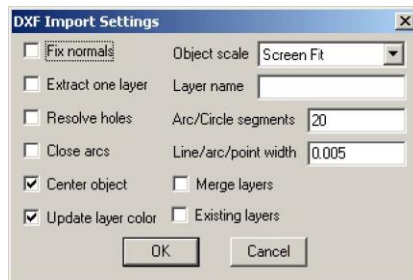
File Formats

C.1 3D Input Formats

Import Settings Panel

In the Load Object dialog, click the Settings button to bring up an import settings panel for the currently-selected file format.

DXF Import

- **Fix Normals:** Reverses the normals for the object. Use this option if objects appear to be imported inside out.
- **Object Scale:** Converts the object to a desired unit system, no unit system, or to fit onscreen.
- **Extract One Layer:** Only a desired layer is imported. The layer name is to be selected from the Layer name field. Objects not associated with any layers are always imported. Subsequently, layers are preserved as separate objects.
- **Layer name:** Combination box containing either a list of layers in the selected file, or a text field when no file is selected in Load Object dialog.
- **Resolve Holes:** Properly imports holes associated with some variations of DXF files. If holes are not imported properly, enable this option.

- **Arc/Circle Segments:** Sets the resolution of arcs and circles when they are converted to polygons.
- **Close Arcs:** Any arc entities in the file will become solid polygons with edges that go around the arc and to its center point.
- **Line/Arc/Point Width:** Sets the size of polygons when .DXF entities are converted from 2D to 3D.
- **Center Object:** Places the object at the World center (0,0,0).
- **Merge layers:** Places all imported object on one layer.
- **Update layer color:** Use this option to keep the trueSpace layer color instead of colors used in DXF file. (This updates the DXF layer color with the trueSpace layer color.)
- **Existing layers:** Place imported object to existing layer if exists.

Certain DXF entities and options are not currently supported as follows: lines with no width, extrusion vectors, bulges in polylines, polyarcs, 3dlines, traces, text, shapes, and types.

Layer structure after importing a DXF file:

Merge Layers	Existing Layers	Description
On	On	All imported objects will be stored in current active layer in trueSpace.
On	Off	All imported objects will be stored in a newly created layer in trueSpace.
Off	On	New layers will only be created in trueSpace for missing layers.
Off	Off	New layers will be created in trueSpace for each layer from DXF file.

Layers in trueSpace are identified by unique layer numbers, not by name, so there may exist several layers with the same layer name. Therefore, when you try to import the same DXF file with Existing Layers off, new layers will be added after each import.

PostScript Import

trueSpace can import .EPS, .PS, and .AI files.
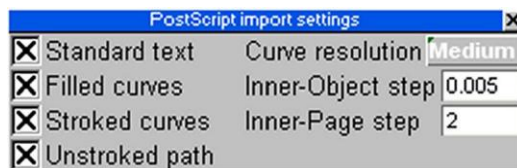
- **Standard text:** This is a kind of text you get when you type in a word processor. It is different from the text that you generally type in a structured drawing program. With this option turned off, you can, for

example, read in a page containing text and graphics and have only the graphics converted.

- **Filled curves:** Convert solid colored regions PostScript entities like circles and other closed curves.
- **Stroked curves:** Convert outlines and thin, potentially open, curve or line PostScript entities.
- **Unstroked path:** Import unstroked path as a NURBS curve.
- **Curve resolution:** This allows you to control the quality of the conversion from curves to trueSpace polygons. Set according to your needs, but Low should be adequate for almost anything unless your artwork/text is extremely detailed (e.g. 12 point text).
- **Inner-Object step:** This allows you to "layer" the different curves, characters, text, etc. as they are loaded. Larger values can be used to exaggerate the spacing between shapes and create some interesting special effects.
- **Inter-Page step:** This is similar to Inner-Object step but is the amount of space that will be put between all of the shapes in one page and all of the shapes in the next page in multi-page PostScript documents. In addition each PostScript page will come in as a separate trueSpace object.

DirectX Import

The DirectX (*.x) file format supports importing of all templates defined in Version 1.13 January 13, 1997.

VRML 1.0 Import

This is the Virtual Reality Modeling Language, version 1.0. trueSpace will load .WRL files as well as any JPEG textures associated with the world.

Amiga Caligari Import

All of the information present in the Amiga Caligari .SOB file will be converted including hierarchy, color and smoothing.

3D Studio Binary Import

Separate objects within a .3DS file will be loaded as sub-objects of a single parent. Lights and cameras are not currently supported. Hierarchy information is not currently maintained. Object colors are taken from 3DS diffuse color. All materials default to auto-facet. Texture mapping coordinates are preserved, and texture formats supported will also transfer. When loading 3DS objects that have texture maps, the directory where the 3DS object is stored is now the first one searched for texture maps. If a requested texture cannot be found there, then trueSpace will prompt you for the location of the texture file.

3D Studio ASCII Import

Separate objects within a file are loaded as sub-objects of a single parent. There is no hierarchy information in the file, so it cannot be correctly converted. There is no material information in ASCII files beyond simply labeling different polygons with different material group names. Polygons that are supposed to have different materials are recognized, and each different material group in the file will be represented as a different shade of gray. Texture mapping coordinates are preserved.

Imagine Import

As with 3D Studio binary files, each different object within an Imagine file will be loaded as a sub-object of a single parent object. Although there is hierarchy information in the file, it is not currently converted. Colors are converted. All materials are set to auto-facet.

LightWave Import

Surface details and one-and two-point polygons are not converted. All surface information possible, including smoothing, glossiness, and color, are converted. Only objects from version 5.6 and earlier can be imported, and they should be reduced to a single layer before exporting from Lightwave.

VideoScape Import

Surface details and one-and two-point polygons will be ignored. All VideoScape material numbers (including 2.0 additions) are correctly converted.

Wavefront Import

Since Wavefront files can have object groups which conflict with trueSpace hierarchies (this is typically the case), grouping information is not preserved. Material names will be run through a name parser with associated color information in an attempt to convert well-named materials to actual colors with transparency. E.G., "light blue" will be recognized and result in a color of R173 G216 B230 A100, as will "ltblue" and many other variants.

BVH Import

BVH files are popular format for motion capture. There are a lot of BVH animations available for download on web, available both free and for a fee.

C.2 3D Export Formats
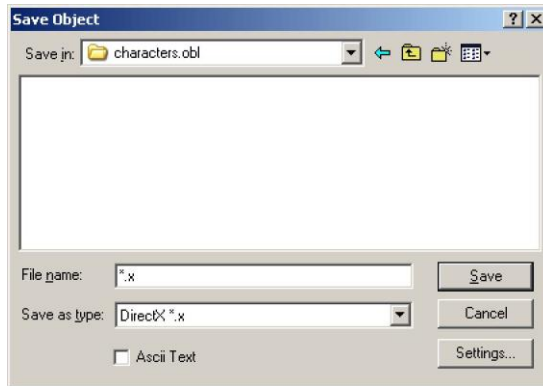
Export Settings Panel

In the Save Object dialog, click the Settings button to bring up an export settings panel for the currently-selected file format.

trueSpace 4.3/5.x/6.0/6.6 Object/Scene Export

trueSpace7 objects and scenes can be exported to older trueSpace formats. This provides the possibility to use them in an earlier version of trueSpace if needed. Note that only objects and parameters supported by the previous versions will be exported - the others will be ignored.

iSpace Object/Scene Export

trueSpace objects and scenes can be exported in iSpace format. This provides the possibility to export geometry and animation for future use in Caligari iSpace1.0. Note that only object and parameters supported by iSpace1 will be exported - the others will be ignored.

BVH Export

BVH files are popular format for motion capture.

COLLADA export

COLLADA is a popular 3D format used in game industry but it is also supported by high end DCC tools such as SoftImage, Maya and 3D Studio..

User Interface

Select object to export. You can select multiple objects if you want to export multiselection into one file. Select whole scene (scene node) to export whole scene. In File menu, select Save. Type desired file name and choose Rosetta Collada export files (*.dae). Click on save. Exporter dialog will open.
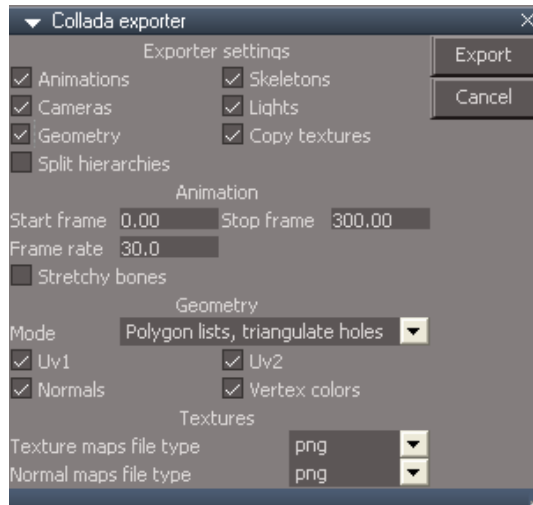
Choose desired exporter properties and click Export.

Collada exporter provides various settings to allow exporting only resources you are interested in. These settings are provided:

- **Animations:** Animations will be exported. Start and end frames as well as desired frame rate are provided in Animation section. When exporter panel opens, start and stop frame as well as frame rate are set according to animation view.
- **Skeletons:** Exporter exports skeletons with skinned meshes. You can enable support for bone stretching for animations. This may not be supported by other applications.
- **Cameras:** enable export of cameras.
- **Lights:** enable export of lights.
- **Geometry:** export meshes and skins. For geometry you can chose resources you want to export like UV coordinate sets, normals or vertex colors. trueSpace Collada exporter allows to export geometry in 4 forms available by Collada file format:
  - o Export as triangles
  - o Export as polygons where faces with holes are triangulated (for compatibility reasons as holes are not widely supported)
  - o Export as polylists where faces with holes are triangulated
 - o Export as polygons with holes.

- • **Copy textures:** Create directory together with exported file and copy there bitmaps used by materials.
- • **Split hierarchies:** don't export hierarchy; every object will be added directly to scene root.

Another way to export to Collada is to create Collada library and drag&drop objects from scene there. Dropping object to library will open exporter dialog.

You can use exporter directly from script by calling
RsImport.ExportCollada('path','nodes to export');   Exporter panel will not be opened but settings stored in this panel will be used.

DirectX Export

There are trueSpace features that cannot be exported into the .x file format because DirectX does not support them. These are limitations of DirectX and not of trueSpace's exporter. DirectX does not support material animation. However, trueSpace exports the animation of IK objects, converting it into Move and Rotate keyframes of all sub-objects of the IK object in each.
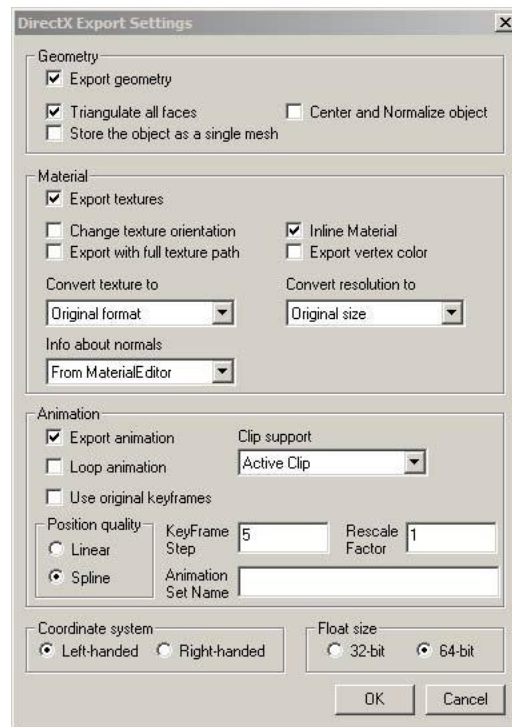
Geometry Options
- • **Export geometry:** Check box for exporting mesh data.
- • **Triangulate all faces:** Triangulate all faces if you experience problems with the untriangulated geometry,

in particular in the DirectX viewer.

- **Store object as a single mesh:** Hierarchical objects can be exported with a hierarchy, or they can be converted to a single mesh object. In the case of a single mesh export, the frame, including the transformation matrix information and animation, is not exported.
- **Center and normalize object:** Object is exported centered and with a normalized size for easier viewing in DirectX viewer.

Material Options
- **Export Material:** Check box for exporting material (texture) data.
- **Change texture orientation:** Old X format supported another orientation than new one DirectX 8.1. You have the option to select to change orientation of textures for the old DirectX format, or orientation by version 8.1 or newer.
- **Export with full texture path:** Export the texture bitmap with full texture path. If disabled, the texture file will be copied into the current object export directory.
- **Inline material:** You can choose define a material inside a mesh or before mesh declaration.
- **Export vertex color:** Add or remove vertex color from X file (template MeshVertexColors). When this template is in the exported file, some DirectX engines can mix this value from standard material (Material template)
- **Info about normals:** Since DirectX does not support autofacet materials, feature edges of the object must be exported explicitly by gameSpace at the expense of a larger file size for the exported object. Enable this option if your geometry has important feature edges that have to be exported precisely.
- **Convert textures to:** Type of exported format. You can choose form PNG, JPG, TGA, DDS or BMP. For example the oldest DirectX format supports only 8bit BMP textures with size a power of 2, so viewers using this format are not able to read another format. There is a necessary conversion of textures to 8bit bitmap that have a size of a power of 2.
- **Convert resolution to:** Type of exported resolution. You can choose form 512x512, 256x256, 128x128, 96x96, 64x64, 32x32 or find closest exponent calculation of number 2.

Animation Options
- **Export Animation:** Export selected object or scene with animation.
- **Animation Loop:** Loop animation sequence. Default value is off
- **Animation Set Name:** Name of Active Animation Channel
- **Rescale Factor:** Value for user-defined keyframe scale factor for animation export with range from 0 to 99999. Default value is 1.
- **Keyframe step value:** Value for user-defined keyframe step animation export with range from 0 to 999.
- **Use original keyframe:** Select if you want to export the original keyframes defined in gameSpace (from the scene editor).
- **Position Quality:**   Linear or spline position quality

Float size: Define floating point size for DirectX format. 32-bit or 64-bit.

Coordinate system: Exported object is in Left-handed or Right-Handed coordinate system.

VRML Export

trueSpace will output both VRML 1.0 and 2.0 formats. You can control which version to output through a switch in the Export VRML File dialog.
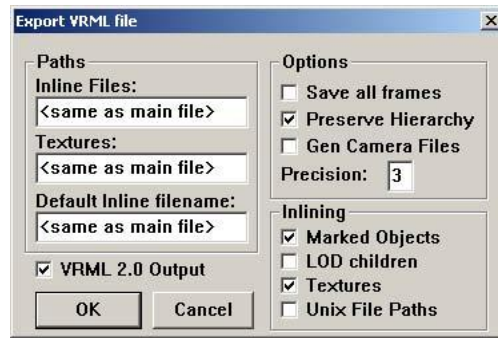
Paths

- **Inline Files:** This is the name of a sub-directory where all inlined objects will be saved. The sub-directory should already exist inside the directory you selected in the Save Scene dialog. If this setting is blank, or is set to the default value of <same as main file>, inlined objects are saved in the same directory as the main VRML file.
- **Textures:** This is the name of a sub-directory where all textures will be saved. The sub-directory should already exist inside the directory you selected in the Save Scene dialog. If the setting is blank, or is set to the default value of <same as main file>, textures are saved in the same directory as the main VRML file.
- **Default Inline filename:** When trueSpace creates inlined files, it will base the name of the file on the name of the main VRML file. If you change this setting from the default of <same as main file>, the name you enter will be used as the base inline filename.

General Options

- **Save all frames:** All frames of the animation will be stored explicitly in the VRML file. Use this if the interpolation provided by the VRML player gives different results than trueSpace animation playback itself. Note that interpolation between keyframes in trueSpace is more sophisticated than that of VRML so the playback results may differ if only the keyframes are exported.
- **Preserve Hierarchy:** If this setting is enabled, trueSpace will preserve full hierarchical information that can be useful when further editing the VRML file. On the other hand, disabling the option will result in smaller (and possibly more compatible) VRML files.
- **Gen Camera Files:** This option generates separate camera files for each camera in your scene.
- **Precision:** This setting controls the numeric precision of the resulting VRML file. Setting this value to one or two digits will result in a smaller VRML file.

Inlining Options

- **Marked Objects:** If this option is enabled, any objects marked for inlining in the Object Info Panel will be saved as separate inline files. This option is enabled by default.
- **LOD Children:** If this option is enabled, any LOD group will be saved as separate inlined files; one file is created for each level of detail. This option is disabled by default.
- **Textures:** If this option is enabled, all textures will be saved as separate inlined files. This option is disabled by default.

- **Unix File Paths:** This controls how the path names are written into a VRML file. If your inlined files are in the same directory as the main VRML file, or if you have no inlined files, this option will have no effect. By default, this option is disabled. If, for example, you have a BRICK.JPG texture in your TEXTURES directory, any reference to this texture in your VRML file will be TEXTURES\BRICK.JPG, using the DOS backslash for paths. With this option enabled, trueSpace will instead output forward slashes in paths, which is the Unix convention. Thus, references to your texture will now be output as TEXTURES/BRICK.JPG. trueSpace can read in files with either type of path. This allows you to enable this setting, yet still test your worlds locally.
- **VRML 2.0 Output:** When enabled, this option causes world files to be saved in VRML 2.0 format. Note that trueSpace cannot load this format. If you want to be able to load your saved worlds back into trueSpace, disable this option. Also, be sure to save your worlds in .SCN format as a backup.
  Note: trueSpace supports many different image formats for textures. If you use formats such as Targa and Bitmap, these files will be output with your world. However, nearly all VRML browsers cannot handle these files. We recommend that you only use JPEG files as textures when creating VRML files.

VRML 1.0 output summary: geometry (IndexedFaceSets only), transformation, hierarchies, inlines, LOD, material (color, reflectance) properties, textures (both inlined and external), light, camera, audio object.

VRML 2.0 output summary: geometry (IndexedFaceSets only), transformation, groups, inlines, LOD, material (color, reflectance) properties, textures (both inlined and external), light, camera, audio object, keyframe animation of object, light and camera movements.

DXF Export

Material numbers for each face will be written as the color number for each DXF face. This will cause all faces of a certain trueSpace material to be shown as a different color when re-read. Faces that have more than four sides will be triangulated before writing. Currently, no layer information is written to the file. Some DXF readers may require that all entities be associated with a layer.
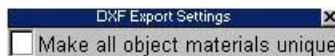
- **Make all objects materials unique:** Material number for each face will be written as the color number for each DXF face.

3D Studio Binary Export

All faces will be triangulated when written to the 3D Studio file. This is a requirement of 3D Studio. Full hierarchy information is stored into 3D Studio file. Basic material information is stored into 3D Studio file: diffuse color, shading type, shininess and transparency. Texture bitmap files and bump bitmap files are stored also. Each face can have assigned a different material. Faces are stored in appropriate smooth groups, therefore smooth and faceted surfaces are supported.

3D Studio ASCII Export

All faces will be triangulated when written to the 3D Studio file. This is a requirement of 3D Studio. Sub-objects within a trueSpace object will be written as separate objects within the 3DS file. True hierarchies cannot be

represented in 3D Studio ASCII files, so this at least preserves grouping information. There is no material information in ASCII files except for a material name. This name will be set to the RGBA value of the trueSpace material, so reconstructing at least this much information is easy.

Object Animation

trueSpace can save a file that contains only the animation information on an object. This is useful primarily for game developers who want to save several animation paths for one object. These .CAN files cannot be read back into trueSpace.

C.3 2D Rendering Formats

AVI (.AVI)

This is an animation file which can be played with Windows Media Player. Bit depth depends on the type of compression used. Rendering an .AVI file to disk opens a compression settings panel:
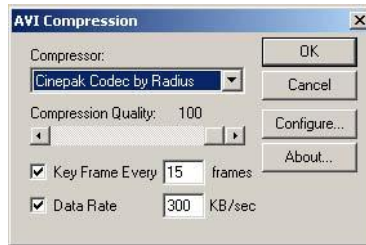

- **Compressor:** This list contains all available compressors currently installed. This depends on the version of Microsoft Video for Windows installed.
- **Compression quality: This** option may not be available for all compressors and determines the final quality of the image. A high number means better image quality with less compression.
- **Key frame every:** This option determines how many frames will be saved to file (this does not affect the frame rate of the animation) and how many will be in-betweened. A value of 2 means that the first frame would be saved to disk whole and only the changes to the second frame would be recorded, and so on. This is an effective way to compress simple animations but does not yield good results for animations where there is much camera movement.
- **Data rate:** Allows you to optimize the file for the target hardware device.
- **Configure:** This option allows access to a secondary settings panel for a specific compressor if one exists.

Bitmap (.BMP, .DIB)

This is a standard Windows bitmap file and contains 24-bit color depth information.

Flic (.FLC)

This is an 8 bit animation file that can be played back either in DOS or Windows. Rendering a .FLC file to disk opens a settings panel:
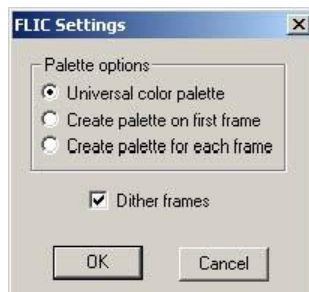
- • **Universal color palette:** The animation uses a preset 8-bit palette suitable for most animations.
- • **Create palette on first frame:** The animation uses a palette created from the colors from the first frame of the animation. This option does not work well if new colors are introduced during the animation.
- • **Create palette for each frame:** Creates a palette for every frame rendered but is not suitable for playing back on an 8-bit display.
- • **Dither frames:** Enables dithering to avoid color bands created because of the color limit. This sometimes causes artifacts in animations.

JPEG (.JPG)

This is a compressed 24-bit file. Rendering a Jpeg file to disk opens a settings panel for the quality level. A high value means better image quality and less compression.
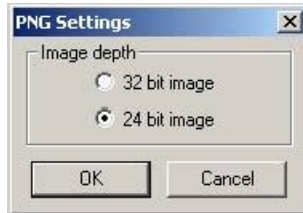

Targa (.TGA)

This file can be either 24 or 32 bits. A 32-bit file contains an additional 8-bit "alpha" containing transparency information (areas in the scene where the background color is seen). Targa files also have the option of compression. Rendering a .TGA file to disk opens a settings panel:


Png (.PNG)

This file can be either 24 or 32 bits. A 32-bit file contains an additional 8-bit "alpha" containing transparency information (areas in the scene where the background color is seen). Rendering a .PNG file to disk opens a settings panel:

DDS (.DDS)

This file can be either 24 or 32 bits. A 32-bit file contains an additional 8-bit "alpha" containing transparency information (areas in the scene where the background color is seen).

Rendering a .DDS file to disk opens a settings panel:
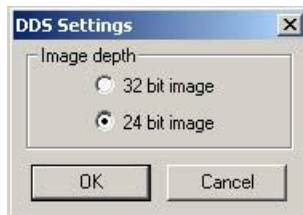
TIFF (.TIF)

Reading and writing of PackBits compressed and uncompressed 24 bit RGB scan-line data is supported. This is compatible with the baseline TIFF 6.0 specification (June 1992).

Photoshop PSD (.PSD)

For details on the features and options available when exporting to Adobe Photoshop's PSD format, see **Artist Guide Chapter 5: Lighting and Rendering.**